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MADRAS: Observations, 1862–3–4. 1 vol., 4to, cloth.

MAEDLER: Dorpat Observations, vol. 13, 1856. 4to, half roan.

PARIS: Annuaire Bureau des Longitudes, 1876 and 1877. 2 vols., 16mo, paper.

WASHINGTON: U. S. Naval Observatory. Eclipse Report of 1878. 4to, cloth.

WASHINGTON: U. S. Transit of Venus Commission Report 1874. I, 4to, cloth.

PRELIMINARY NOTE ON TERRESTRIAL ATMOSPHERIC ABSORPTION OF THE PHOTOGRAPHIC RAYS OF LIGHT.

As the tabular data below may be of immediate use to some astronomers, I have thought it well to publish them at once. They are deduced from an extended investigation which I took up in 1889 at the suggestion of Professor HOLDEN. The observations (exposures), measures, and the method of reduction, form the subject-matter of a memoir now being published by the University of California.

The final results are based upon four different series of observations, as follows:

First Series, at Mt. Hamilton, in September, 1889.
Second Series, at Cayenne, S. A., in December, 1889.
Third Series, at Mt. Hamilton, in July and August, 1890.
Fourth Series, at Mt. Hamilton, in November, 1891.

The exposures for the third series were kindly made for me by Professor CAMPBELL, who at the time was spending his vacation at the LICK Observatory; the other three series of exposures were made by myself. All the observations, with the exception of those belonging to the fourth series (which were made with our CROCKER telescope) were made with a 6-inch equatorially mounted DALLMEYER lens belonging to the United States Naval Observatory, and loaned to the LICK Observatory primarily for the purpose of taking it to our eclipse station at Cayenne.

Before the reduction of the observations on atmospheric absorption of the photographic rays of light could be undertaken it was evidently necessary to determine the relation which exists, for the given telescope, between the diameters of the stellar images for known exposure times and the brightness of the corresponding stars. Some results of an investigation on this subject will be found in the *Publications of the Astronomical Society of the Pacific*, Vol. I, No. 4. See also *Astronomical Journal*, No. 269.

It is not necessary for me to make any extended remarks as to how the observations were made and reduced, as the memoir on this subject will soon be in the hands of astronomers.

The final empirical expression which represents the law of photographic absorption is one of a series (for each of which nearly the whole mass of material was worked over by the method of least squares) which best represents all the observations. I found that

If B_0 denotes the photo-brightness of a star in the zenith,
B " " " " at the zenith distance ζ degrees, and f a constant for a given state of the atmosphere, then

$$B = B_0 \left[1 - f.\tan\left(\left(\frac{\zeta}{12}\right)^2\right)\right]^2$$

In this expression $\left(\frac{\zeta}{12}\right)$ is to be regarded as an abstract number, whose square expresses the number of degrees of which trigonometrical tangent is required. For a normal condition of the atmosphere and for *Sirian* type stars, the value of the factor f is 0.60.

The tables given below are computed for these conditions, using the same light ratio for the photographic magnitudes that is employed in visual determinations.

The argument for entering the table is the observed zenith distance, the corresponding function is the amount of the (photographic) atmospheric absorption expressed in photographic *magnitudes*.

Observed Z. D.	Photographic Absorption	Observed Z. D.	Photographic Absorption	Observed Z. D.	Photographic Absorption	Observed Z. D.	Photographic Absorption
	mag.		mag.		mag.		mag.
0°	0.00	50°	0.44	71°	1.2	81°	2.1
5	0.00	55	0.56	72	1.2	82	2.2
10	0.01	60	0.71	73	1.3	83	2.3
15	0.04	65	0.89	74	1.4	84	2.5
20	0.07	70	1.12	75	1.4	85	2.7
25	0.11	75	1.45	76	1.5	86	2.9
30	0.16	80	1.94	77	1.6	87	3.3
35	0.21	85	2.68	78	1.7	88	3.7
40	0.28	90	5.00	79	1.8	89	4.2
45	0.35			80	1.9	90	5.0

These values are to be added to the (unknown) absorption in the zenith to obtain the absolute absorption.

In presenting the above results to astronomers for practical use, I feel quite confident that they will be sufficiently accurate for all exposures made on SEED plates sensitometer No. 26, which have been *fully* developed. J. M. SCHAEBERLE.

MOUNT HAMILTON, October 20, 1892.

In celestial photography it is very desirable to have some simple and convenient method of doing away with the reflection from the back of the photographic plate. Especially is this the case when it is desired to obtain representations of very faint objects in the immediate neighborhood of very bright stars. Some experiments which I have made led up to the following simple and effectual method:

On the photographic plate, held in a horizontal position, film side down, a number of drops of clean water are allowed to fall near the centre of the plate; a piece of red glass* is then placed upon this water in such a way that no air spaces can be formed between the two glass surfaces. The capillary attraction will keep the water between the glass surfaces, and a border frame of blotting paper will keep any stray water from reaching the film side of the plate. Folding "book" plate-holders (like the "Daisy") may be used to keep the glasses pressed together during the exposure. The difference between the density of glass and water being much less that of air and water, nearly all the blue rays which have passed through the film now easily enter the red glass surface and are absorbed.

After the exposure of the plates, the whole combination can be placed in the developing tray before the removal of the red glass, if so desired. J. M. SCHAEBERLE.

ERRATA IN *PUBLICATIONS* NO. 25.

By an error of the printers the advertisements at the end of No. 25 of the Publications were printed on page 204 (the reverse of page 203). Members are requested to remove page 203 (end of No. 25) when binding the present volume. The pagination will then be correct. THE COMMITTEE ON PUBLICATION.

On page 199 the numbering of the Satellites of *Jupiter* in the order of occultation should read IV, II, I and III. J. M. S.

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* Somewhat smaller than the sensitive plate.